DOVER/KENT COUNTY MPO
METROPOLITAN PLANNING ORGANIZATION

Delaware State University Pedestrian Counts

January 2019

CENTURY ENGINEERING

Introduction

The Dover/Kent County Metropolitan Planning Organization (MPO) and Delaware Department of Transportation (DelDOT) requested a pedestrian study be performed along the roadways adjacent to the Delaware State University's (DSU) Dover Campus. The study corridor included US Route 13 / N. Dupont Highway (K2) ("US13") between the Delaware State University Commons entrance and College Road (K99), and along College Road (K99) from US13 to University Courtyard Apartments at Jason Court. Pedestrian activity within the study corridor has long been a concern, as on-campus residences are on one side of the road, while restaurants and retail centers are on the opposite side. DSU and DelDOT have previously completed projects to improve pedestrian and bike safety at studied intersections through improved crosswalks, signalization timing, and added bike lanes. Traffic counts were completed in 2013 and 2014 to gauge impacts to pedestrian utilization of facilities. As part of the 2014 efforts, it was recommended that future counts were to be completed annually. These 2018 counts were performed to determine if the completed improvements influenced pedestrian behavior since the 2014 counts, and to identify additional areas of concern.

Pedestrian activity was measured at nine (9) intersections within the study corridor to determine hourly pedestrian volumes as well as pedestrian movement patterns. The following intersections were observed as part of this study:

- Location 1 – US13 at Delaware State University Commons
- Location 2 – US13 and Rustic Lane
- Location 3 – US13 at North Dover Mall Entrance
- Location 4 – US13 at South Dover Mall Entrance
- Location 5 – US13 at Delaware State University Entrance
- Location 6 – US13 at Dover Downs Entrance
- Location 7 – US13 and College Road
- Location 8 – College Road at Old College Road
- Location 9 – College Road at Jason Court

The counts were conducted on two days in November while DSU classes were in session. The first count occurred on Saturday, November 17th, 2018, a Saturday with a scheduled DSU football game. The second count occurred on Tuesday, November 27th, 2018, a weekday while classes were in session. The counts were held between the hours of 9:00 AM to 2:00 PM and 3:00 PM to 6:00 PM. Both days were partly cloudy with average temperatures of approximately 40° F.

The information collected was compared to pedestrian counts performed at the same locations in 2013 and 2014. While the number of pedestrian volumes may vary, the study looked for trends in pedestrian behavior similar to the previous counts, including use of pedestrian facilities and locations of non-controlled crossings.

Photos and data from each intersection are shown at the end of this report.

Count Observations

During the study period, pedestrians entering each intersection were tabulated. Compliance with designated crosswalks was also measured, including the count of pedestrians crossing within the crosswalk, outside of the crosswalk, or "midblock" (over 20 feet from a designated crosswalk). The same count and compliance measurement was completed for bikes. The direction of travel was not recorded for this study; each individual count was tabulated by the approach crossed by the bike or pedestrian. Use of non-bicycle facilities by bike riders was noted.

Count Classifications:

- Within Crosswalk: Pedestrians crossed intersection using designated crossing area.
- Without Crosswalk: Pedestrians crossed at intersection, but not via designated crossing. These crossings occurred within twenty feet of the intersection.
- Midblock Crossing: Pedestrians crossed roadway, but did not cross at intersection or within designated crossing area. These crossings occurred more than twenty feet away from the intersection.

The following tables detail the total number of observed pedestrians at each studied intersection for years 2013, 2014, and 2018. It should be noted that during the 2013 and 2014 Saturday counts, Delaware State University's homecoming was taking place. While a football game was still taking place during 2018 Saturday counts, it was not homecoming weekend. Additionally, during the Tuesday, November 27th, 2018 count, construction near the College Road and Old College Road intersection forced a high number of pedestrians to cross Old College Road.

Table 1: Weekday Total Number of Pedestrians by Year (2013, 2014 & 2018)

Location	9:00 am - 2:00 pm			3:00 pm - 6:00 pm		
	2013	*2014*	*2018*	*2013*	*2014*	*2018*
1.) DSU Commons	17	14	19	13	6	21
2.) Rustic Lane	90	95	49	61	65	40
3.) North Dover Mall Entrance	63	52	42	42	44	19
4.) South Dover Mall Entrance	24	85	51	24	133	30
5.) DSU Entrance	124	79	82	92	78	43
6.) Dover Downs Entrance	97	66	25	108	90	44
7.) College Rd & US13	30	52	26	63	52	21
8.) College Rd at Old College Rd	284	267	599	241	217	334
9.) Jason Court	300	278	160	213	226	71

Table 2: Saturday Total Number of Pedestrians by Year (2013, 2014 & 2018)

Location	9:00 am - 2:00 pm			3:00 pm - 6:00 pm		
	2013	*2014*	*2018*	*2013*	*2014*	*2018*
1.) DSU Commons	17	16	20	13	9	20
2.) Rustic Lane	66	88	69	49	82	50
3.) North Dover Mall Entrance	82	77	37	71	88	37
4.) South Dover Mall Entrance	51	159	46	65	287	44
5.) DSU Entrance	180	753	59	218	1173	138
6.) Dover Downs Entrance	86	180	61	71	310	76
7.) College Rd & US13	56	97	40	52	114	18
8.) College Rd at Old College Rd	157	140	65	26	345	73
9.) Jason Court	18	207	31	109	376	33

The following **Table 3** details the observed pedestrian compliance with crossing conditions at each studied intersection, including the total count number of pedestrians and a breakdown of pedestrians crossing "Within Crosswalk" and pedestrians crossing "Outside Crosswalk". The "Outside Crosswalk" pedestrian volumes include both the pedestrians counted in the "Without Crosswalk" and "Midblock Crossing" count classifications. Additional information on pedestrian volumes counted as "Midblock Crossing" is included in **Table 4**, with the volumes separated by both count time periods for each the weekday count and Saturday count.

Table 3: 2018 Pedestrian Compliance with Crossing Movements by Volume (Percentage)

Location	SATURDAY 11/17/18		TUESDAY 11/27/18	
	9:00 am - 2:00 pm	*3:00 pm - 6:00 pm*	*9:00 am - 2:00 pm*	*3:00 pm - 6:00 pm*
1.) DSU Commons	**20**	**20**	**19**	**21**
Within Crosswalk	20 (100%)	9 (45%)	16 (84.2%)	8 (38.1%)
Outside Crosswalk	0 (0%)	11 (55%)	3 (15.8%)	13 (61.9%)
2.) Rustic Lane	**69**	**50**	**49**	**40**
Within Crosswalk	68 (98.6%)	48 (96%)	44 (89.8%)	31 (77.5%)
Outside Crosswalk	1 (1.4%)	2 (4%)	5 (10.2%)	9 (22.5%)
3.) North Dover Mall Entrance	**37**	**37**	**42**	**19**
Within Crosswalk	34 (91.9%)	34 (91.9%)	39 (92.9%)	19 (100%)
Outside Crosswalk	3 (8.1%)	3 (8.1%)	3 (7.1%)	0 (0%)
4.) South Dover Mall Entrance	**46**	**44**	**51**	**30**
Within Crosswalk	34 (73.9%)	38 (86.4%)	47 (92.2%)	26 (86.7%)
Outside Crosswalk	12 (26.1%)	6 (13.6%)	4 (7.8%)	4 (13.3%)
5.) DSU Entrance	**59**	**138**	**82**	**43**
Within Crosswalk	58 (98.3%)	130 (94.2%)	78 (95.1%)	38 (88.4%)
Outside Crosswalk	1 (1.7%)	8 (5.8%)	4 (4.9%)	5 (11.6%)
6.) Dover Downs Entrance	**61**	**76**	**25**	**44**
Within Crosswalk	59 (96.7%)	75 (98.7%)	22 (88%)	40 (90.9%)
Outside Crosswalk	2 (3.3%)	1 (1.3%)	3 (12%)	4 (9.1%)
7.) College Rd & US13	**40**	**18**	**26**	**21**
Within Crosswalk	34 (85%)	17 (94.4%)	19 (73.1%)	19 (90.5%)
Outside Crosswalk	6 (15%)	1 (5.6%)	7 (26.9%)	2 (9.5%)
8.) College Rd at Old College Rd	**65**	**73**	**599**	**334**
Within Crosswalk	41 (63.1%)	53 (72.6%)	275 (45.9%)	118 (35.3%)
Outside Crosswalk	24 (36.9%)	20 (27.4%)	324 (54.1%)	216 (64.7%)
9.) Jason Court	**31**	**33**	**160**	**71**
Within Crosswalk	7 (22.6%)	6 (18.2%)	15 (9.4%)	4 (5.6%)
Outside Crosswalk	24 (77.4%)	27 (81.8%)	145 (90.6%)	67 (94.4%)

Table 4: 2018 Pedestrian Midblock Crossing Total

Location	SATURDAY 11/17/18		TUESDAY 11/27/18	
	9:00 am - 2:00 pm	*3:00 pm - 6:00 pm*	*9:00 am - 2:00 pm*	*3:00 pm - 6:00 pm*
1.) DSU Commons	0	0	0	0
2.) Rustic Lane	0	2	2	5
3.) North Dover Mall Entrance	1	3	3	0
4.) South Dover Mall Entrance	0	5	2	4
5.) DSU Entrance	0	0	0	0
6.) Dover Downs Entrance	2	0	1	2
7.) College Rd & US13	3	1	1	0
8.) College Rd at Old College Rd	0	0	2	0
9.) Jason Court	3	10	38	7

While Table 3 above provides details on pedestrian compliancy with crosswalk utilization for the 2018 counts, **Table 5** below provides for the non-compliance percentage of pedestrian "Outside Crosswalk" per year for comparison and review of compliancy trends improving or declining at each count location. The majority of locations have a lower or comparable percentage then in 2014 indicating better compliance at the count locations.

Table 5: Total Pedestrian Non-Compliance with Crossing Movements (Percentage) – Combined AM & PM Periods

Location	Weekday Non-Compliance %			Saturday Non-Compliance %		
	2013	*2014*	*2018*	*2013*	*2014*	*2018*
1.) DSU Commons	13.0%	30.0%	40.0%	3.0%	4.0%	27.5%
2.) Rustic Lane	21.0%	36.0%	15.7%	30.0%	28.0%	2.5%
3.) North Dover Mall Entrance	15.0%	22.0%	4.9%	23.0%	21.0%	8.1%
4.) South Dover Mall Entrance	4.0%	2.0%	9.9%	2.0%	12.0%	20.0%
5.) DSU Entrance	7.0%	5.0%	7.2%	16.0%	16.0%	4.6%
6.) Dover Downs Entrance	33.0%	42.0%	10.1%	17.0%	31.0%	2.2%
7.) College Rd & US13	17.0%	23.0%	19.1%	8.0%	13.0%	12.1%
8.) College Rd at Old College Rd	11.0%	17.0%	57.9%	17.0%	27.0%	31.9%
9.) Jason Court	7.0%	91.0%	91.8%	94.0%	90.0%	79.7%

The following **Table 6** includes observed bicycle volumes at each of the count locations, including "With Crosswalk", "Without Crosswalk", and "Midblock Crossing". The volumes are separated by count time period for both Weekday and Saturday counts. While Table 6 includes bicycle volumes crossing the roadway, the attached figures *do not* include observations of bicycles utilizing sidewalks adjacent to the roadway. It should be noted that not all bicycles utilizing the sidewalks, crossed the intersection.

Table 6: 2018 Observed Bike Total

Location	SATURDAY 11/17/18		TUESDAY 11/27/18	
	9:00 am - 2:00 pm	*3:00 pm - 6:00 pm*	*9:00 am - 2:00 pm*	*3:00 pm - 6:00 pm*
1.) DSU Commons	1	0	1	1
2.) Rustic Lane	8	6	2	0
3.) North Dover Mall Entrance	3	3	6	3
4.) South Dover Mall Entrance	3	1	3	3
5.) DSU Entrance	0	5	5	1
6.) Dover Downs Entrance	2	1	3	1
7.) College Rd & US13	8	4	10	3
8.) College Rd at Old College Rd	5	0	2	1
9.) Jason Court	1	0	4	0

Count Summary

Location 1 – US13 and DSU Commons

Summary: There was little crossing activity at Location 1 compared to other intersections. Considering DSU's proximity to Location 1 relative to other intersections in the study area, it is reasonable to assume the lower volumes are accurate. Weekday pedestrian non-compliance was 40.0% (Table 5), with 16 occurring "Without Crosswalk" and 0 "Midblock Crossing". This non-compliance percentage was higher than that observed in 2013 and 2014. Of the 16 total instances of non-compliance crossing during the weekday count, 13 occurred between 3:00 PM and 6:00 PM. Saturday non-compliance was 27.5%, higher than non-compliance rates of 3% in 2013 and 4% in 2014. Consistent with 2013 and 2014 counts, a few pedestrians crossed without using the crosswalk at the intersection. In the spring of 2014, a pedestrian sidewalk was installed along Southbound US13; the sidewalk encourages safer pedestrian travel instead of cutting through the DSU Commons parking lot.

There was a total of two (2) cyclists counted during the weekday count, and one (1) cyclists counted on Saturday. The cyclists rode within bike lanes along US 13.

Concerns: Pedestrians were cutting across the parking lot to get to the Commons entrance, mainly during the weekday PM period.

Recommendation: An additional option is to explore the opportunity to provide a trail connection to DSU's campus west of US13 behind the frontage properties, which may reduce the need to walk/ride along US13.

Location 2 – US13 and Rustic Lane

Summary: Crossing pedestrians at the intersection had two (2) main observed destinations: Wawa and the DSU commons/campus. The diagonal crosswalk across US13 (connecting the southwest corner with the northeast corner) allowed pedestrians to travel from DSU to Wawa; this pedestrian crossing accounted for approximately 39% of observed pedestrian traffic (81 of 208 pedestrians) at the intersection. Pedestrians also frequently traversed the crosswalk across eastbound Rustic Lane, along southbound US13. Weekday and Saturday non-compliance rates were much lower than 2013 and 2014 rates, at 15.7% (7.8% crossed just outside the crosswalk, 7.9% crossed mid-block) and 2.5% (0.9% crossed just outside the crosswalk, 1.7% crossed mid-block), respectively. The overall movement pattern was consistent with 2013 and 2014 data.

A total of 16 bicyclists were observed using the crosswalks and traveling in the northbound and southbound bike lanes on US 13. It should be noted that a transit stop exists along northbound US 13, approximately 75 feet north of Rustic Lane.

Concerns: The primary concern was the midblock crossing north of Rustic Lane. The majority of these crossings seemed to be going to/from the Commons and Wawa.

Recommendation: Continue to educate the residents and users of the Commons facility to cross at designated crossing locations. Additional signage should be considered to deter pedestrians from crossing mid-block. This includes "CROSS ONLY AT CROSS WALK" (R9-2) and "USE CROSSWALK" (R9-3bP) signs.

Location 3 – US13 and North Dover Mall Entrance

Summary: Although the Dover Mall is east of US13, only 15.6% of observed pedestrian crossings were across US13, including mid-block crossings. The majority of observed pedestrian crossings were in the northbound and southbound direction; a possible contributing factor may be the 2014 construction of a sidewalk along southbound US13. Weekday and Saturday non-compliance rates were much lower than 2013 and 2014 rates, at 4.9% (zero observed crossings just outside the crosswalk, 4.9% crossed mid-block) and 8.1% (2.7% crossed just outside the crosswalk, 5.4% crossed mid-block), respectively. The overall movement pattern was relatively consistent with 2013 and 2014 data, with a bit less traffic across US13 and more traffic along southbound US13.

A total of 15 bicyclists were observed using the crosswalks and traveling in the northbound and southbound bike lanes on US 13; nine (9) bicyclists were observed during weekday counts, while six (6) bicyclists were observed during Saturday counts. It should be noted that a transit stop exists along southbound US 13, approximately 180 feet south of Rustic Lane.

Concerns: In 2013 and 2014, midblock crossing north of the Dover Mall Entrance was the primary concern. While there were improvements at the study location, in 2018 more than 8% of observed pedestrians followed this midblock pattern.

Recommendation: Continue to educate pedestrians along the corridor to cross at designated crossing locations. Additional signage should be considered to deter pedestrians from crossing mid-block. This includes "CROSS ONLY AT CROSS WALK (R9-2) and "USE CROSSWALK" (R9-3bP) signs.

Location 4 – US13 and South Dover Mall Entrance

Summary: The majority of pedestrians at this location use designated crosswalks to cross the southbound approach of US 13 and the Dover Mall south entrance. A likely contributing factor to this pattern is the pedestrian path connecting the US13 crosswalk with the DSU campus, in addition to the aforementioned sidewalk along southbound US13. Weekday non-compliance was higher than 2013 and 2014 at 9.9% (2.5% crossed just outside the crosswalk, 7.4% crossed mid-block); Saturday non-compliance of 20% (14.4% just outside the crosswalk, 5.6% mid-block) was higher than 2013 and 2014 observed non-compliance. Pedestrian travel patterns are similar to those in 2013 and 2014, although there were substantially more pedestrians during the 2014 counts; the total number of observed pedestrians in 2018 was less than 29% of the observed 2014 volumes.

A total of 10 bicyclists were observed using the crosswalks and traveling in the northbound and southbound sidewalks and bike lanes on US 13, including six (6) during weekday counts and four (4) during Saturday counts.

Concerns: While pedestrian usage of the crosswalks, sidewalk, and paths at this study location, cyclists were also observed using the sidewalk. Consideration should be given to further evaluation of bicycle volumes utilizing the designated roadway bike lanes versus the sidewalks.

Recommendation: Further investigation of bicycle traffic utilizing sidewalks versus designated bike lanes in the roadway as initial steps in evaluating the need to widen the existing sidewalks to utilizing as shared-use path (SUP).

Location 5 – US13 and Delaware State University Entrance

Summary: Observed weekday non-compliance was slightly above that observed in 2013 and 2014 at 7.2%, while the Saturday non-compliance rate of 4.6% was observed to be lower than 2013 and 2014 values of 16%. No mid-block crossings were observed at this location on both count dates. A contributing factor is likely the southbound US13 sidewalk, which is “protected” by fencing and landscaping. The intersection had frequent crossing traffic, and saw significantly higher pedestrian volumes during the Saturday count, with 197 observed pedestrians to the weekend count of 125. A contributing factor to the volume increase is the Saturday football game, as spectators parked at the Dover Mall and Best Buy and crossed US13 to go to the stadium. The pedestrian patterns are similar to those from 2013 and 2014.

A total of 11 bicyclists were observed using the crosswalks and traveling in the northbound and southbound bike lanes on US 13, including six (6) during weekday counts and five (5) during Saturday counts.

Concerns: Overall compliance with pedestrian conditions was high, and no pedestrian crossing issues seem to exist.

Recommendation: For DSU's football games, police presence is recommended to help to control traffic and protect pedestrians.

Location 6 – US13 and Dover Downs Entrance

Summary: Approximately 67% of observed pedestrian volumes were crossing US13; it appears pedestrians were crossing to travel to and from DSU and restaurants (Boston Market, Chipotle, Grottos) on the east side of US 13. A few pedestrians walked from the parking lot on DSU's campus and crossed immediately at the end of the brick wall, a pattern similar to that observed with 2013 and 2014 counts, but at a far lower rate. Overall non-compliance was much lower than in 2013 and 2014, with non-compliance rates of 10.1% (5.8% crossed just outside the crosswalk, 4.3% crossed mid-block) and 2.2% (0.7% crossed just outside the crosswalk, 1.5% crossed mid-block) during weekday and Saturday counts, respectively. A contributing factor is likely the southbound US13 sidewalk, which is "protected" by fencing and landscaping.

A total of seven (7) bicyclists were observed using the crosswalks and traveling in the northbound and southbound bike lanes on US 13, including four (4) during weekday counts and three (3) during Saturday counts.

Concerns: There is significant pedestrian traffic coming from the DSU campus and parking lot which crosses US 13 where the brick wall ends. Previously, weekday mid-block crossings were an issue as a result of this pattern, but 2018 counts indicate this issue has been mitigated.

Recommendation: No further recommendations are necessary for this location.

Location 7 – US13 and College Road

Summary: Compliance with pedestrian conditions was on par with observed compliance in 2013 and 2014; 2018 rates were in between 2013 and 2014 rates for both weekday and Saturday counts. Overall non-compliance rates of 19.1% (16.9% crossed just outside the crosswalk, 2.2% crossed mid-block) and 12.1% (5.2% crossed just outside the crosswalk, 6.9% crossed mid-block) were observed during weekday and Saturday counts, respectively. While the intersection leads to a shopping center with a variety of stores, the shopping center no longer includes the ACME supermarket, which closed earlier in 2018. This is believed to be a contributing factor to 2018 observed pedestrian volumes, which were much lower than those observed in 2013 and 2014.

A total of 25 bicyclists were observed using the crosswalks and traveling in the northbound and southbound bike lanes on US 13, the most observed at an intersection within the study area. This included 13 during weekday counts and 12 during Saturday counts. Including non-crossing bicyclists traveling along adjacent sidewalks, 42 total bicyclists were observed.

Concerns: While mid-block crossing wasn't very apparent across US13, several pedestrians crossed College Road mid-block.

Recommendation: While additional signage on US13 may be considered to urge pedestrians to cross at the crosswalk (i.e. "CROSS ONLY AT CROSS WALK" (R9-2) and "USE CROSSWALK" (R9-3bP) signs) no further pedestrian safety/traffic control recommendations are necessary for this location. A Shared-Use Path (SUP) adjacent to US13 and into the DSU campus may be considered for implementation at and around the studied intersection as a result of the high observed bicycle volumes. Further investigation would be necessary to determine the limits of a proposed SUP along US13.

Location 8 – College Road at Old College Road

Summary: This was one of the busiest locations in the study. There was significant pedestrian traffic coming from the University Courtyard Apartments on College Road in addition to pedestrians traveling along Old College Road to get to facilities on DSU's campus. Very few people were observed crossing at the intersection at College Road since the existing sidewalk ties into Old College Road before the intersection. During the 2018 weekday count, construction forced pedestrians to cross in the middle of Old College Road; this caused the weekday non-compliance rate to be extremely high, at 57.9% (57.7% crossed just outside the crosswalk, 0.2% crossed mid-block). Without the street crossings, the non-compliance rate would be approximately 14%, in between 2013 and 2014 rates. During Saturday counts, a non-compliance rate of 31.9% was observed (30.4% crossed just outside the crosswalk, zero observed mid-block crossings).

A total of eight (8) bicyclists were observed using the crosswalks and traveling along College Rd and Old College Rd, including three (3) during weekday counts and five (5) during Saturday counts.

Concerns: College Road is on a curve as it approaches the intersection resulting in poor sight lines to pedestrians who are crossing the street. This is further compounded by the appearance that vehicles are traveling faster than the posted speed limit (35MPH). Despite these concerns, pedestrian volumes remain low across College Road at the intersection.

Recommendation: Due to limited space where the sidewalk runs along the roadway/bridge, options for physical barriers are limited. Other options include reviewing pathways at campus apartments for modification to direct pedestrians to the crosswalk, or construction of a larger sidewalk on the northbound side of College Road to accommodate the number of users. Signage and education to encourage pedestrians to cross at designated locations should be evaluated, including "CROSS ONLY AT CROSS WALK" (R9-2) and "USE CROSSWALK" (R9-3bP) signs.

A mid-block pedestrian crossing across College Road should be investigated between this study location and the study location to the south, at Jason Court. This evaluation should take into consideration the appropriateness of an activated crossing, utilizing Rectangular Rapid Flashing Beacon (RRFB) activation or other active or enhanced treatments. The proposed crossing shall offer a safe path across College Road, as there is no marked crossing south of Jason Court.

Additionally, this may be a location where enforcement of both pedestrian and vehicle activity by traffic calming should be considered to reduce vehicle speeds and direct pedestrian crossings at the appropriate locations. A speed study may be performed to determine the necessity of traffic calming measures at the studied location, and to determine if the current speed limit is appropriate for the roadway.

Location 9 – College Road at Jason Court

Summary: As in 2013 and 2014, there was extremely low compliance with pedestrian crossing conditions at the intersection. While Saturday non-compliance was lower than 2013 and 2014 non-compliance rates (94% and 90% respectively) at 79.7% (59.4% crossed just outside the crosswalk, 20.3% crossed mid-block), weekday non-compliance was observed to be 91.8% (72.3% crossed just outside the crosswalk, 19.5% crossed mid-block). It should be noted that prior to 2018 counts, the pedestrian crossing was improved with a median/median refuge island, additional signage, and activated RRFB measures. The signage includes three (3) Pedestrian (W11-2) and three (3) Downward Diagonal Arrow (W16-7P) signs facing *each* approach. There was significant pedestrian traffic going to/from the University Courtyard Apartments traveling toward DSU's campus, but few pedestrians used the marked crosswalk on College Road. There is existing sidewalk on both sides of College Road near the intersection. Pedestrian patterns are very similar to those of 2013 and 2014.

A total of five (5) bicyclists were observed using the crosswalks and traveling along College Rd and into/out of Jason Court, including four (4) during weekday counts and one (1) during Saturday counts. It should be noted that there is a transit stop in front of the University Courtyard Apartments, along northbound College Road.

Concerns: As with the previous location, the curvature of College Road reduces sight distance and vehicles appear to travel faster than the posted speed limit (35MPH). Even with these conditions, an extremely high volume of pedestrians crossed mid-block or outside of the marked crosswalk. While a raised median and pedestrian signage was added to the crosswalk location across College Road (which has improved compliance), overall non-compliance remains high. It may be reasonable to assume the existing marked crosswalk is not in an optimal position for pedestrians traveling to and from Jason Court, as the crosswalk is located on the south side of the intersection while the DSU campus is located to the north.

Recommendation: As a median and warning signs have already been installed, the current safety of the College Road crossing is adequate. However, observed pedestrian movement patterns indicate that the crossing at Jason Court may be located too far south for efficient pedestrian travel. It is assumed that pedestrians leaving Jason Court may be taking the shortest route north to the DSU campus, and leaving the residence area from the north side of the intersection. Pedestrians then continue along the sidewalk located on the northbound side of College Road to a point where they decide to cross outside a crosswalk or mid-block. This mid-block crossing most likely occurs prior to the intersection of Old College Road and College Road as the sidewalk along the northbound side of College Road does not continue all the way to the Old College Road intersection. Furthermore, there are no crosswalks at the Old College Road and College Road intersection due to the lack of sidewalk on the northbound side of College Road. With this noted,

the sidewalk along the southbound side of College Road directs into the DSU campus, providing efficient access to the University. Although the access along the southbound side of College Road is existing, pedestrians leaving Jason Court to go to class would have to walk south to cross College Road just to travel north to DSU. As discussed for Location 8, a crosswalk should be considered north of Jason Court and south of the College Road and Old College Road intersection, to allow for safe and efficient pedestrian travel between Jason Court and DSU. This potential mid-block crossing treatment to the north should be evaluated through further investigation of pedestrian crossing habits along this specific segment of College Road. This can be completed with addition pedestrian observations and counts, as well as determining existing pedestrian desire lines to ensure proper selection of a proposed crossing location.

Additionally like Location 8, this may be a location where enforcement of both pedestrian and vehicle activity by traffic calming should be considered to reduce vehicle speeds and direct pedestrian crossings at the appropriate locations. A speed study may be performed to determine the necessity of traffic calming measures at the studied location, and to determine if the current speed limit is appropriate for the roadway.

Furthermore, 3-year crash data should be reviewed for the segment of College Road from the intersection with Jason Court to the intersection with Old College Road. to determine if a safety issue exists at the location.

Conclusions

As observed in 2013 and 2014, significant pedestrian activity occurs within the studied corridor, largely due to traffic to and from Delaware State University. During home football games, pedestrian volumes increase further. 2018 counts reflect that along US 13, nearly 90% of pedestrians used crosswalks to cross a given approach, while only 38% used crosswalks to cross a given approach on College Road. Compliance along US13 (90%) increased compared to 2014 (85%) and 2013 (83%). Conversely, 2018 compliance on College Road (38%) was lower than compliance in 2013 (50%) and 2014 (42%). It should be noted that the overall pedestrian volume was lower than that observed in 2013 and 2014; however, Saturday counts were not performed during homecoming, as they were in 2013 and 2014. The increase in compliance with pedestrian crosswalks at studied US 13 intersections shows pedestrians have learned to more frequently use the designated crossing areas. However, due to the large pedestrian volumes at studied US13 intersections, and existing traffic volumes, additional improvements should be pursued to encourage further pedestrian safety. Per mitigation suggestions presented in the "Recommendations" section, additional signage should be considered along the studied corridor of US13 to deter pedestrians from crossing mid-block. This includes "CROSS ONLY AT CROSS WALK" (R9-2) and "USE CROSSWALK" (R9-3bP) signs closer to crossings at signalized intersections, and No Pedestrians (R9-3) signs closer to mid-block areas. Improvements should be evaluated based on the "Recommendations" given for each individual intersection.

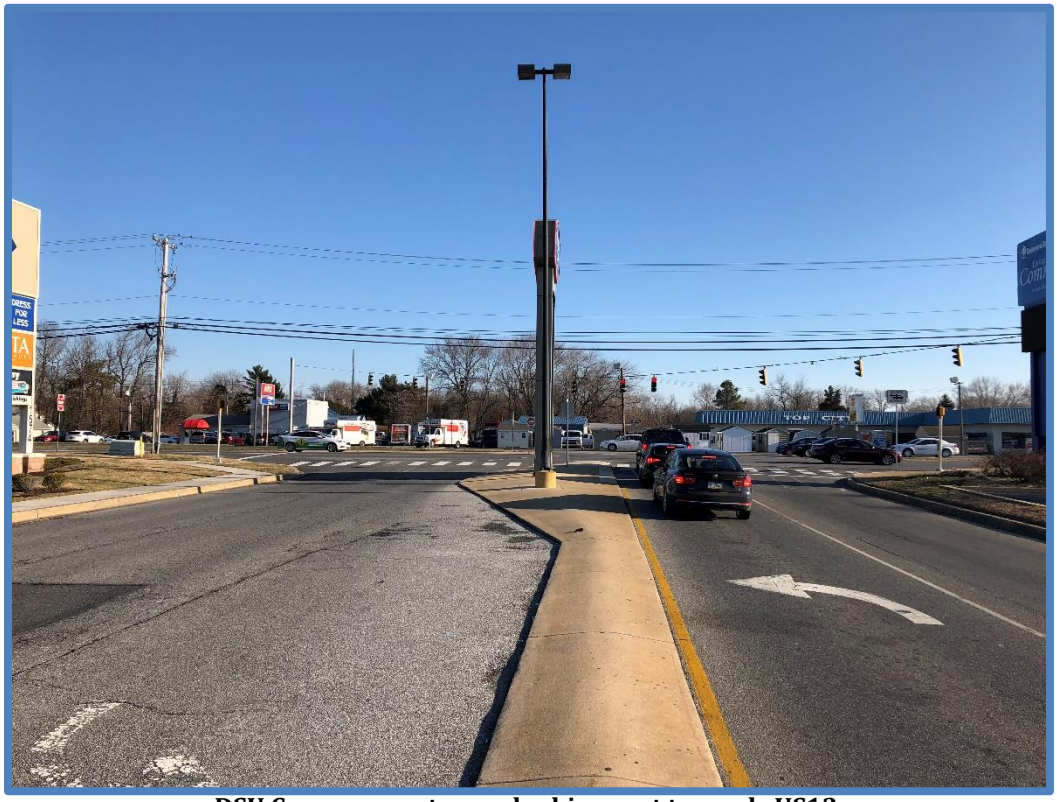
On College Road, pedestrian habits seemed to be consistent as well, but with limited use of pedestrian crosswalks. Pedestrians were observed walking along both shoulders and crossing

when a break in traffic occurred, instead of using the nearest crosswalk. As stated in the "Recommendations" section for both Location 8 and Location 9, an additional activated crossing should be considered across College Road, between the Jason Court intersection and the College Road and Old College Road intersection. These studied locations may require further pedestrian observations and counts, a future speed study, 3-year crash data analysis, and an investigation of traffic calming measures. A sidewalk extending to Old College Road along northbound College road may also be considered.

Cyclist activity was also observed during the counts, but at a significantly lower frequency than pedestrian movements. Bike lanes have previously been installed along US 13 and were utilized by a majority of riders. While the majority of cyclists rode with traffic while in the road, several cyclists were riding the wrong way, against traffic. Those not riding in the bike lanes would typically ride along US13 sidewalks, in both directions. Consideration should be given to widening the sidewalks throughout the study area to provide for an off-road option via a shared-use pathway, as significant bike travel occurred along US13 sidewalks. A Shared-Use Path (SUP) adjacent to US13 and into the DSU campus may be considered for implementation at and around the intersection of US13 and College Road as a result of the high observed bicycle volumes at this studied intersection. Further investigation would be necessary to determine the limits of a proposed SUP along US13.

LOCATION 1 – DSU COMMONS ENTRANCE (SHERATON)

DSU Commons entrance looking north on US13



DSU Commons entrance looking east towards US13

LOCATION 1 – DSU COMMONS ENTRANCE (SHERATON)

DSU Commons entrance looking south on US13

LOCATION 2 – RUSTIC LANE

East side of US13 looking northwest towards W. Rustic Ln

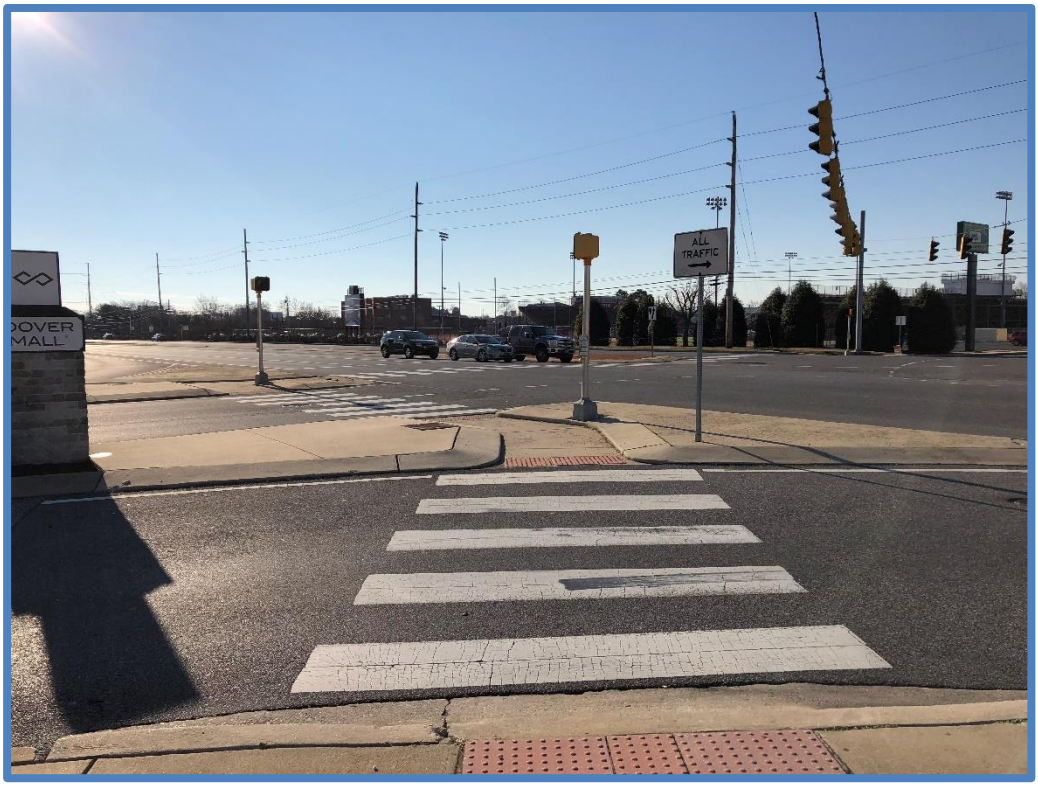
East side of US13 looking southwest towards W. Rustic Lane

LOCATION 2 – RUSTIC LANE

West side of US13 looking northeast towards Wawa

LOCATION 3 – NORTH DOVER MALL ENTRANCE

East side of US13 looking west towards Home Goods



East side of US13 looking southwest towards DSU

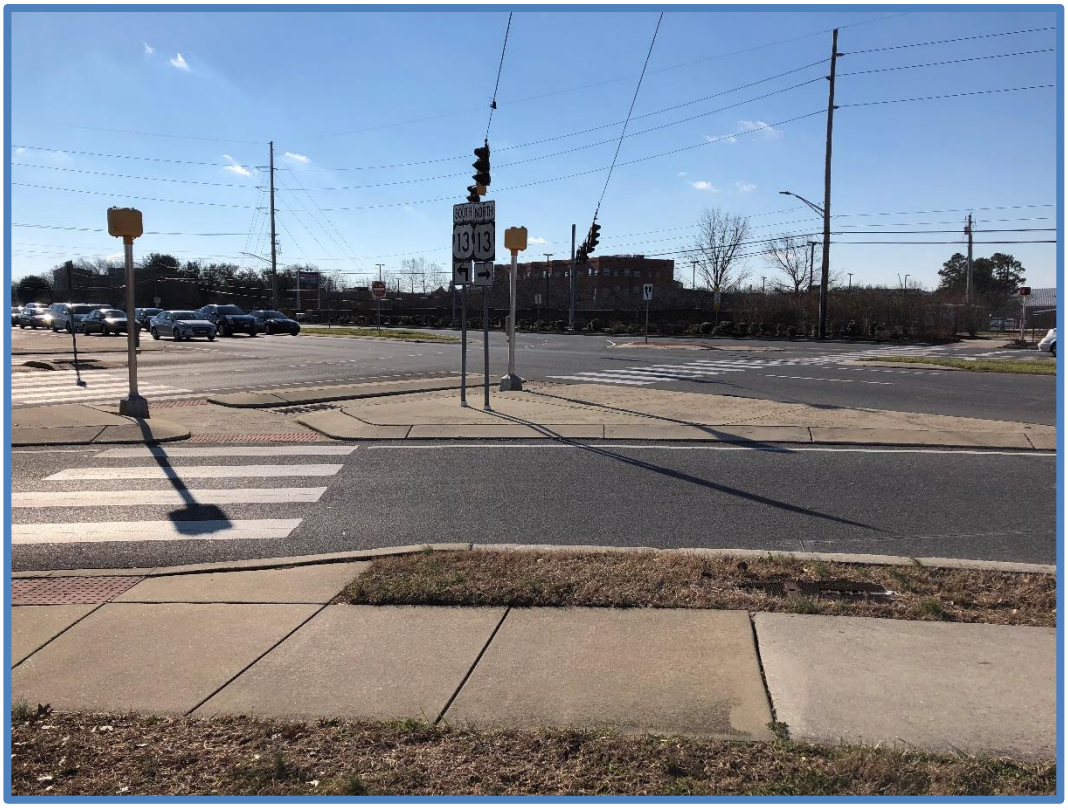
LOCATION 3 – NORTH DOVER MALL ENTRANCE

West side of US13 looking northeast towards Dover Mall

West side of US13 looking southeast towards Dover Mall

LOCATION 4 – SOUTH DOVER MALL ENTRANCE

East side of US13 looking northwest towards DSU Stadium



East side of US13 looking southwest towards Dover

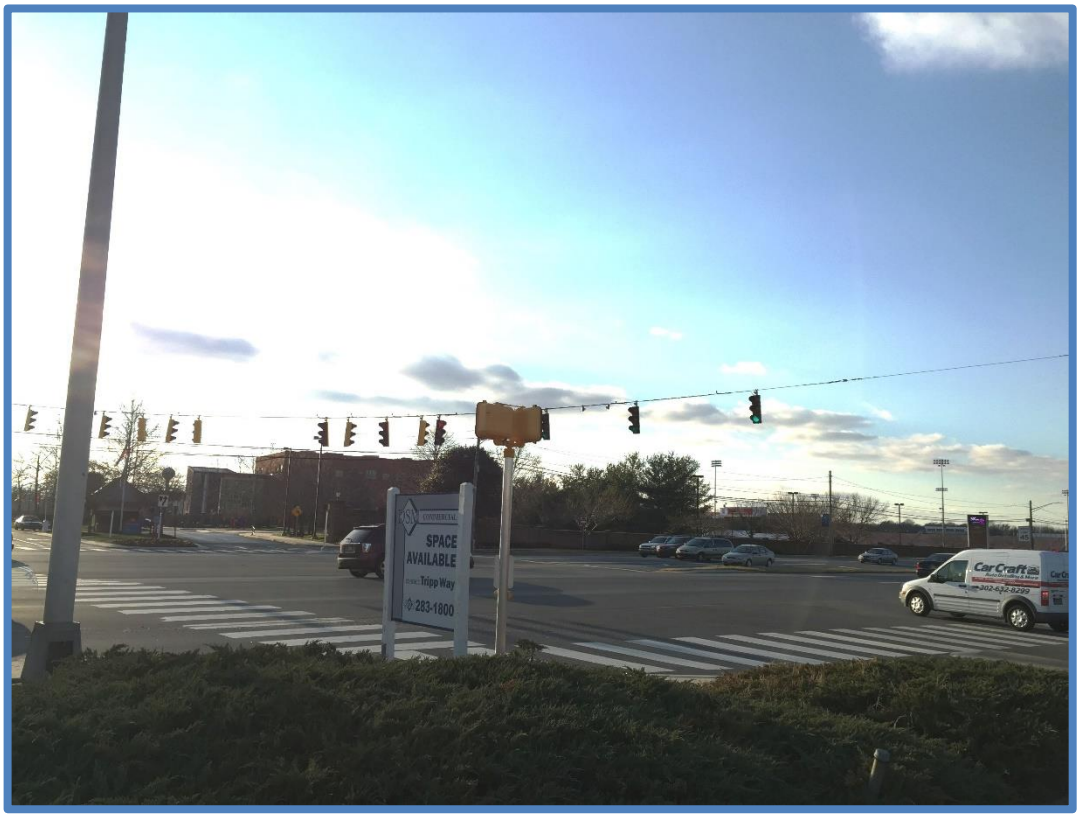
LOCATION 4 – SOUTH DOVER MALL ENTRANCE

East side of US13 looking south towards Dover

West side of US13 looking east towards Dover Mall

LOCATION 5 – DELAWARE STATE UNIVERSITY ENTRANCE

East side of US13 looking west towards DSU



East side of US13 looking west towards DSU

LOCATION 5 – DELAWARE STATE UNIVERSITY ENTRANCE

West side of US13 looking northeast towards Dover Mall

West side of US13 looking east towards BestBuy

LOCATION 5 – DELAWARE STATE UNIVERSITY ENTRANCE

East side of US13 looking southwest towards DSU

LOCATION 6 – DOVER DOWNS ENTRANCE

East side of US13 looking south towards Dover

East side of US13 looking west towards DSU

LOCATION 6 – DOVER DOWNS ENTRANCE

West side of US13 looking East towards Dover Downs

LOCATION 7 – COLLEGE ROAD/US 13

East side of US13 looking south towards Dover

East side of US13 looking northwest towards DSU

LOCATION 7 – COLLEGE ROAD/US 13

West side of US13 looking east towards Staples

West side of US13 looking southeast towards Acme

LOCATION 8 – COLLEGE RD AT OLD COLLEGE ROAD

DSU's entrance at Old College Rd looking west on College Rd

DSU's entrance at Old College Rd looking west towards College Rd

LOCATION 8 – COLLEGE RD AT OLD COLLEGE ROAD

DSU's entrance at Old College Rd looking northwest towards entrance

Looking east on Old College Rd towards DSU's campus

COLLEGE RD CURVE AT DSU ENTRANCE

Looking east on College Rd towards DSU's entrance at Old College Rd.

Looking east on College Rd towards DSU's entrance at Old College Rd.

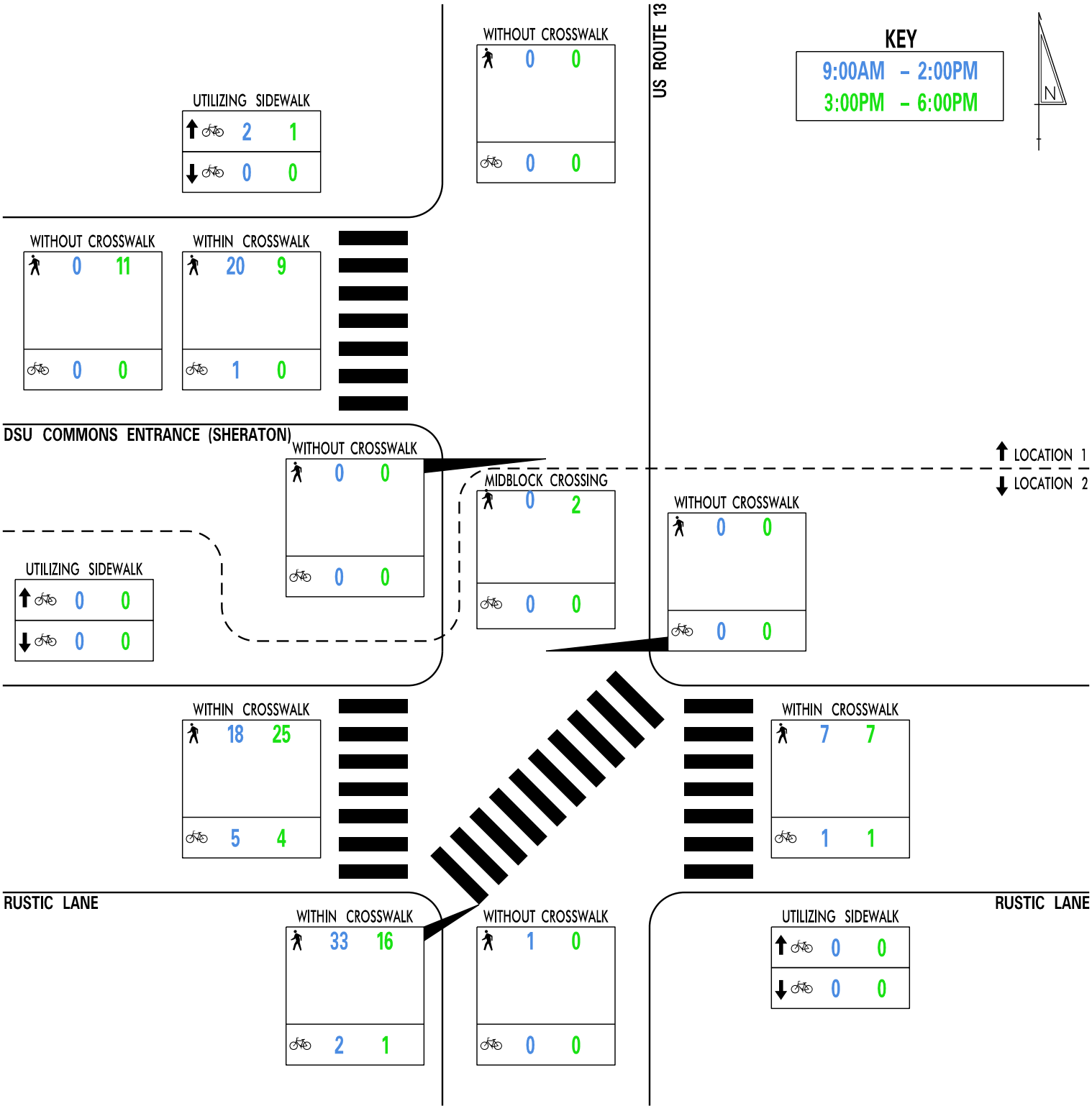
LOCATION 9 – JASON COURT

University Courtyard Apartments looking north toward College Rd

University Courtyard Apartments looking east on College Rd

LOCATION 9 – JASON COURT

RRFB and pedestrian signage at crosswalk



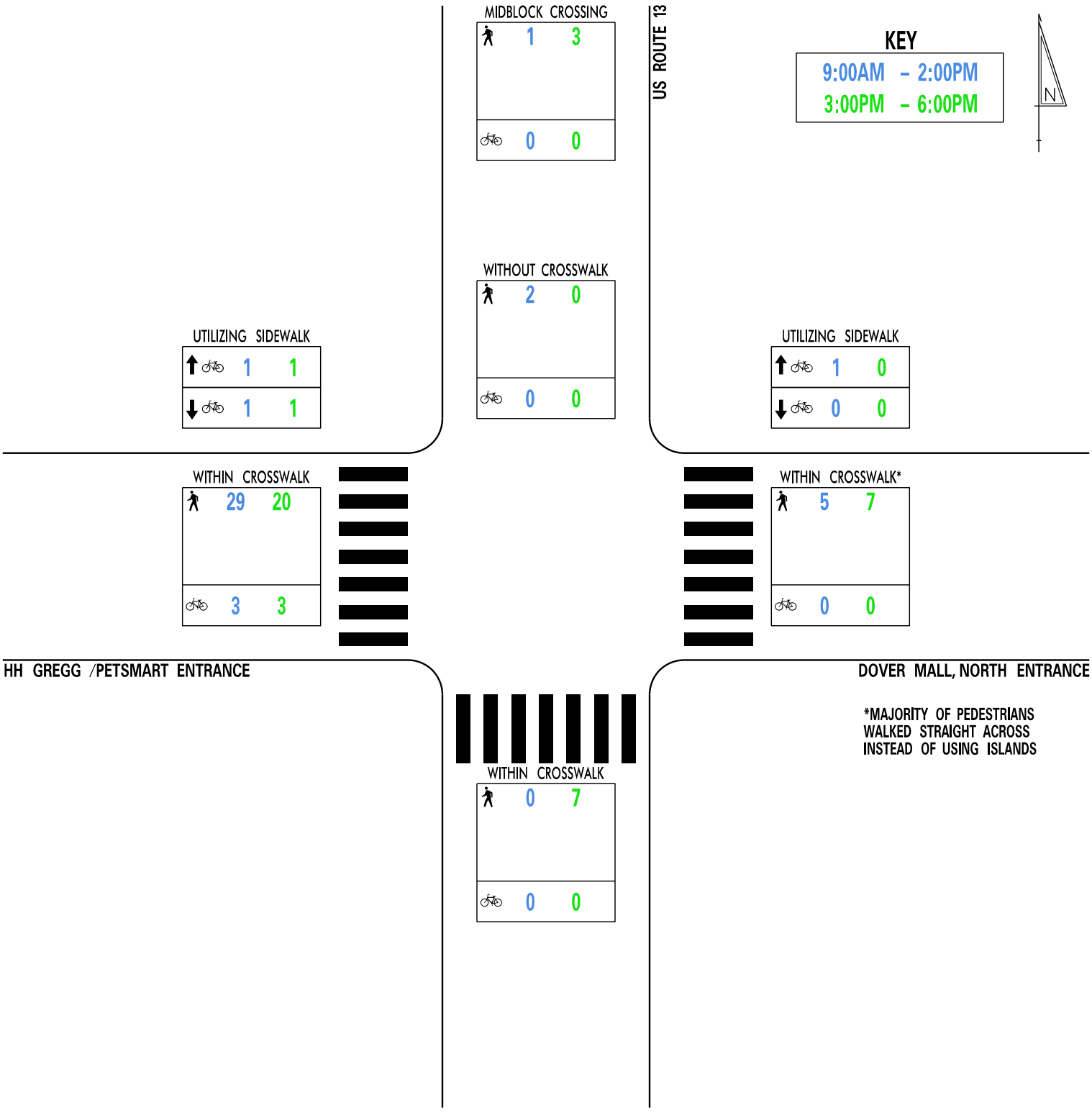
LOCATION: NO. 1 & 2 – DSU COMMONS ENTRANCE (SHERATON)/RUSTIC LANE

DATE: SATURDAY, NOVEMBER 17, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

WEATHER: SUNNY

PREPARED BY: BRANDAN M. & DANE M.



LOCATION: NO. 3 – DOVER MALL, NORTH ENTRANCE

DATE: SATURDAY, NOVEMBER 17, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

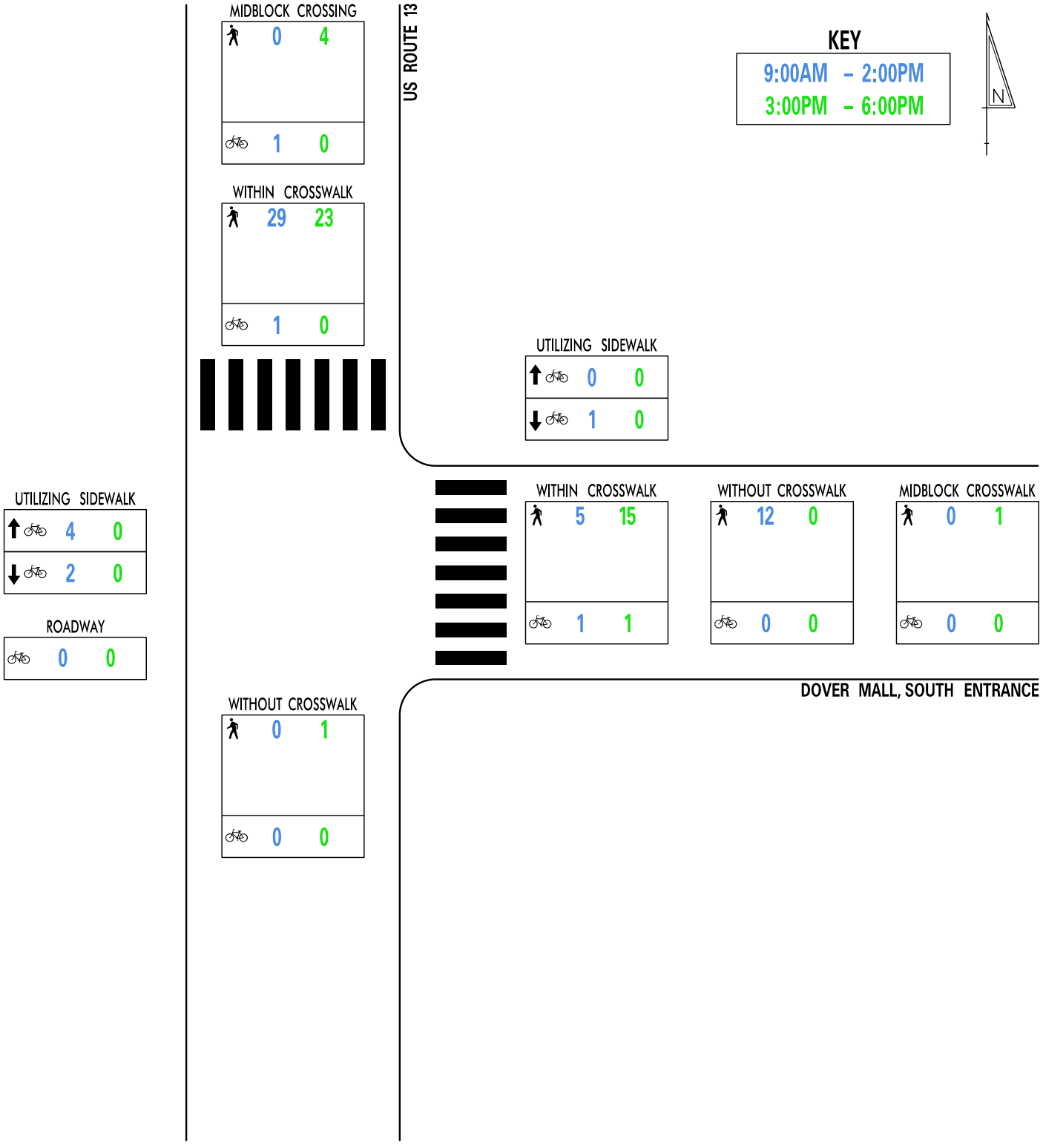
WEATHER: SUNNY

PREPARED BY: ART W.

DELAWARE STATE UNIVERSITY PED STUDY

CENTURY ENGINEERING

DelDOT



LOCATION: NO. 4 – DOVER MALL, SOUTH ENTRANCE

DATE: SATURDAY, NOVEMBER 17, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

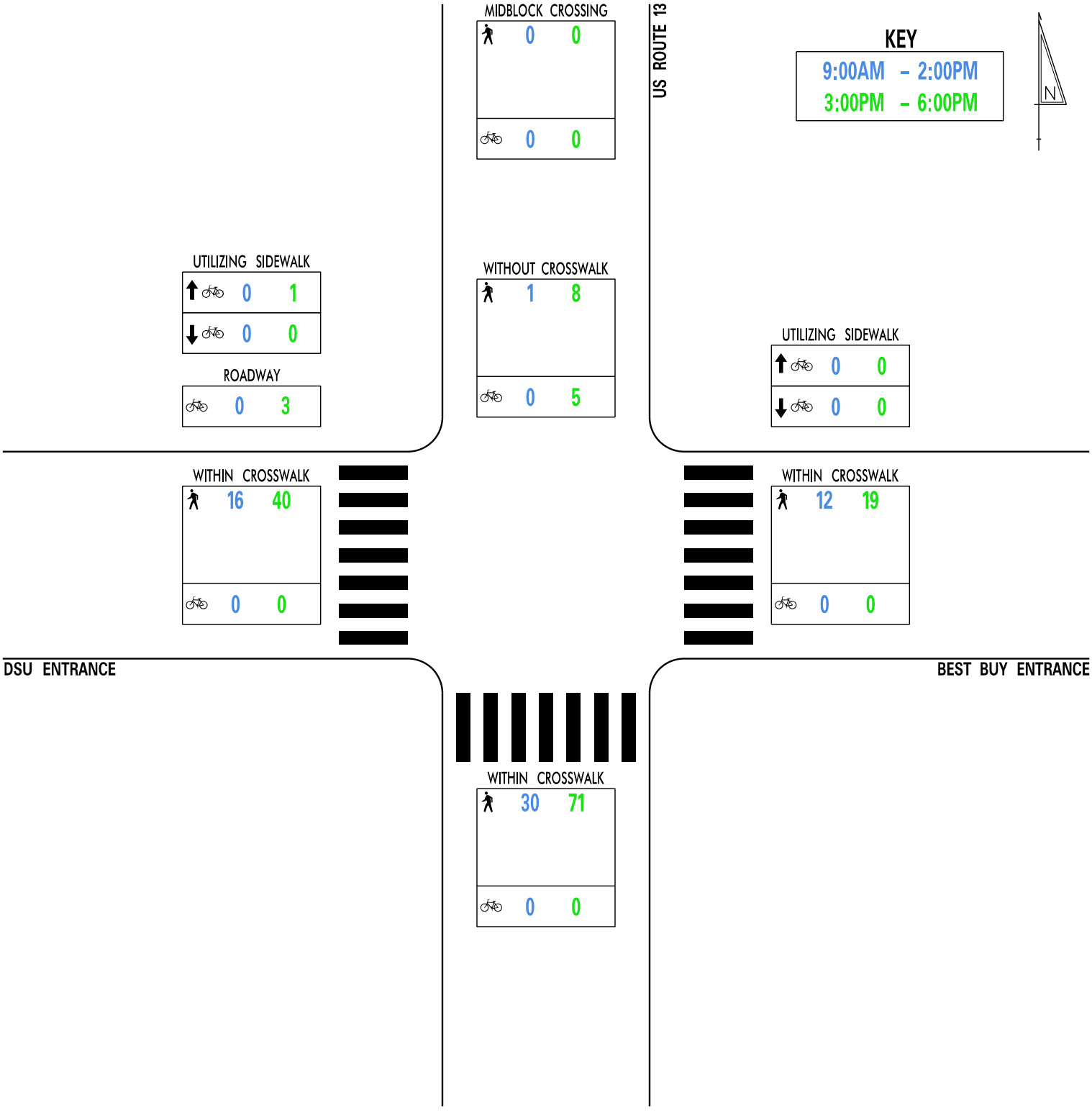
WEATHER: SUNNY

PREPARED BY: DAN P. & BARRY S.

DELAWARE STATE UNIVERSITY PED STUDY

CENTURY ENGINEERING

DelDOT



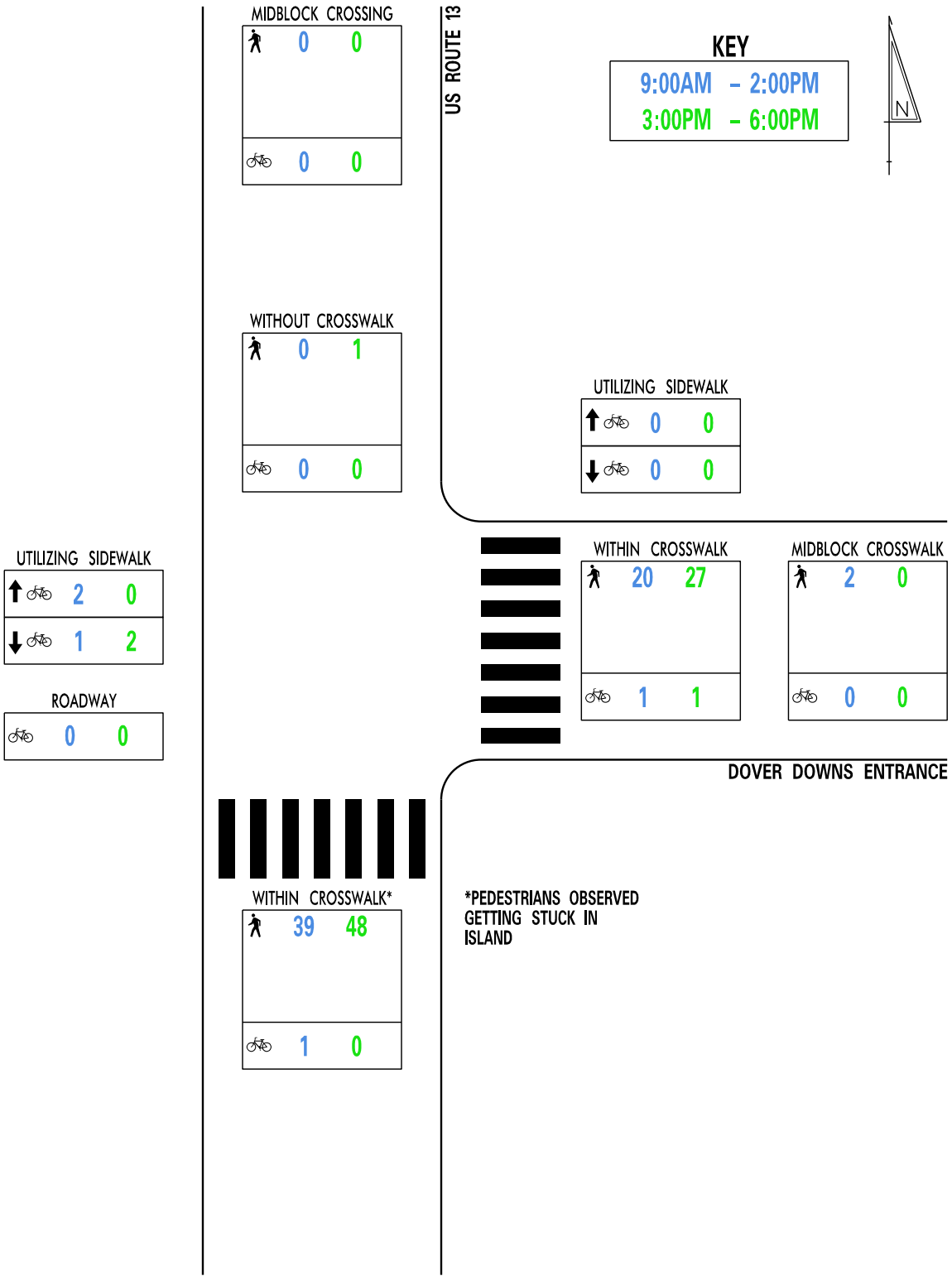
LOCATION: NO. 5 – DELAWARE STATE UNIVERSITY'S ENTRANCE

DATE: SATURDAY, NOVEMBER 17, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

WEATHER: SUNNY

PREPARED BY: RICKY L. & PAT E.



LOCATION: NO. 6 – DOVER DOWNS ENTRANCE

DATE: SATURDAY, NOVEMBER 17, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

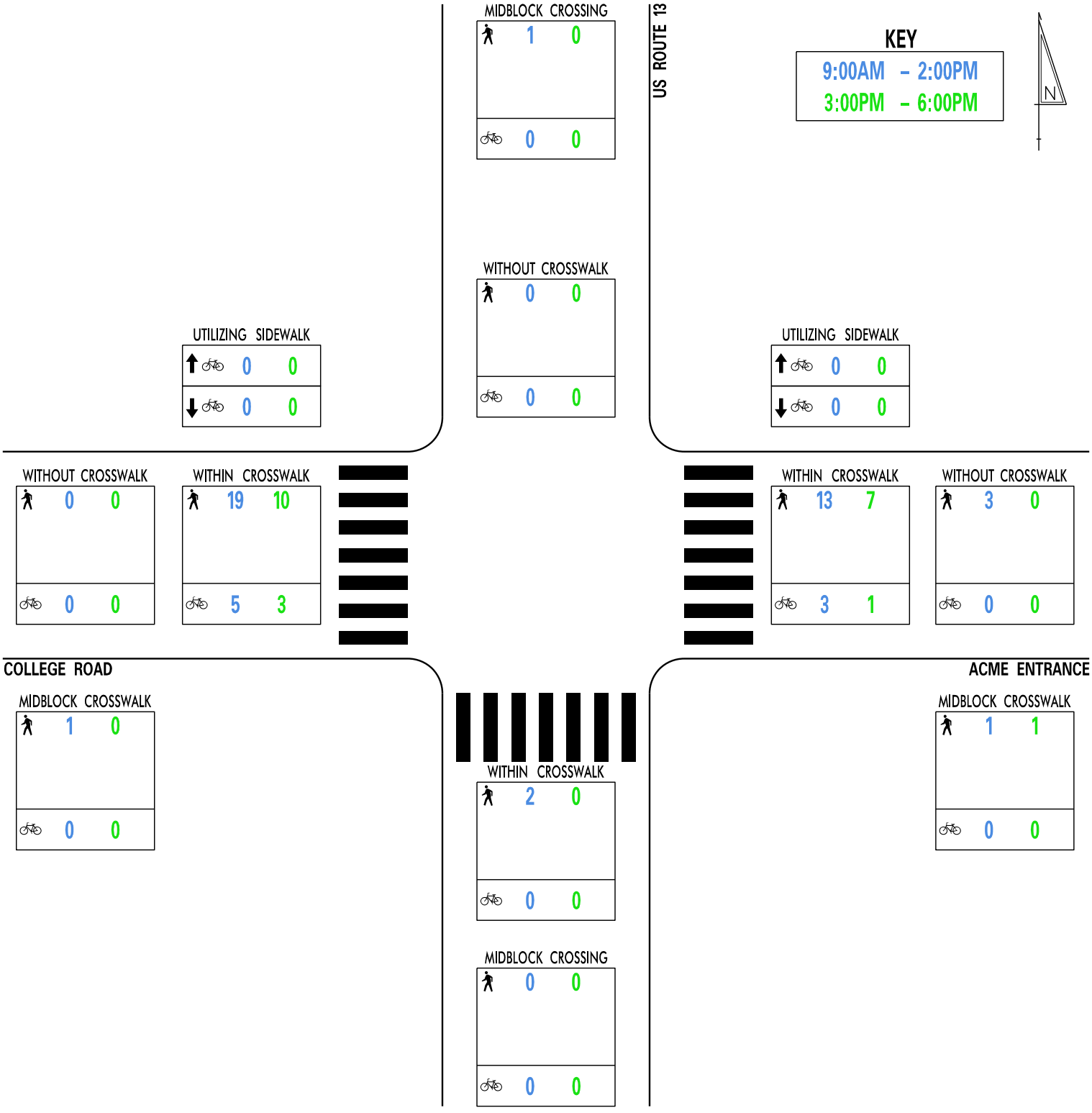
WEATHER: SUNNY

PREPARED BY: CLINTON D.

DELAWARE STATE UNIVERSITY PED STUDY

CENTURY ENGINEERING

DelDOT



LOCATION: NO. 7 – COLLEGE ROAD /ACME ENTRANCE

DATE: SATURDAY, NOVEMBER 17, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

WEATHER: SUNNY

PREPARED BY: DALLAS W.

DELAWARE STATE UNIVERSITY PED STUDY

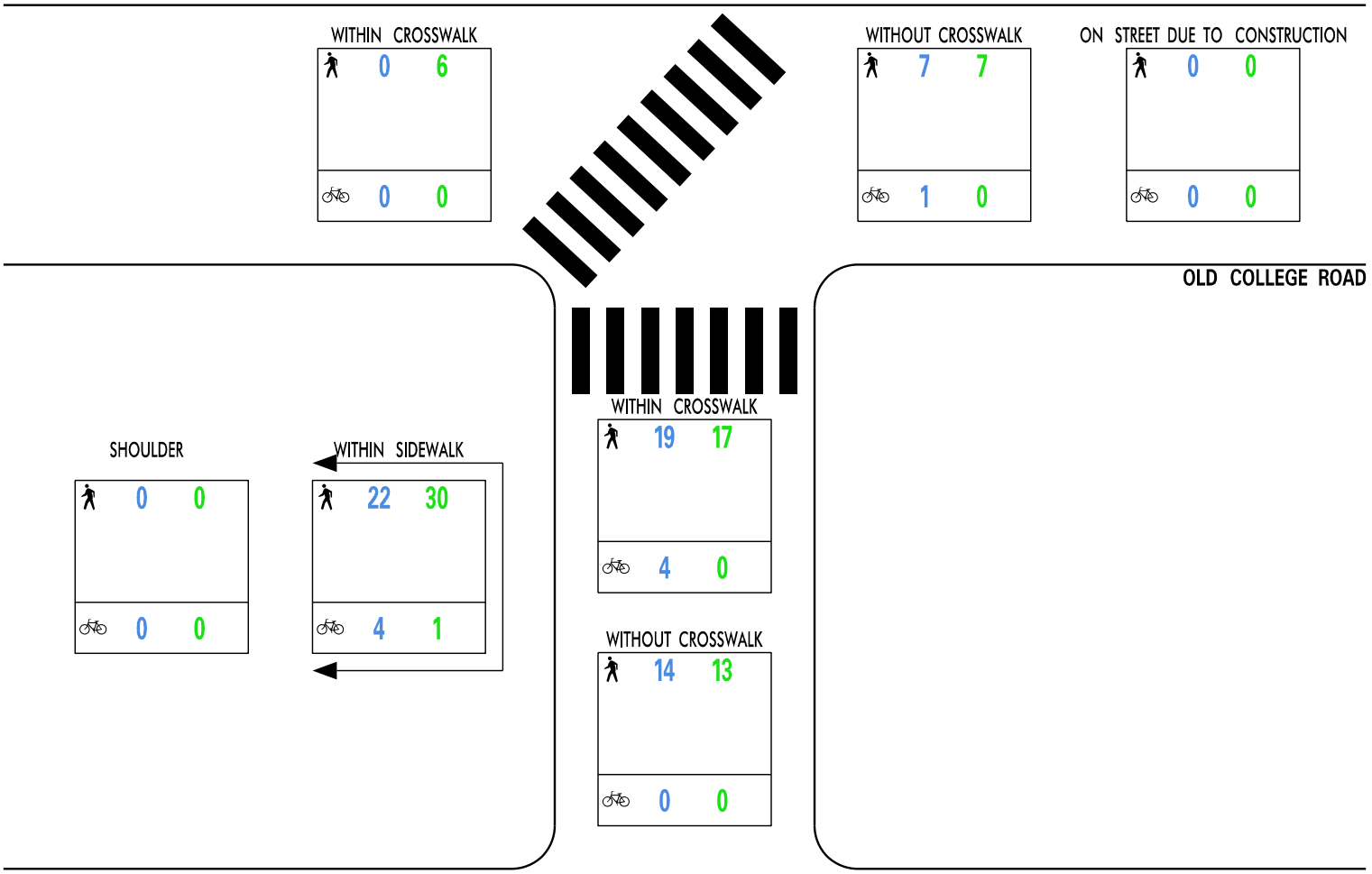
CENTURY ENGINEERING

DelDOT

KEY

9:00AM – 2:00PM

3:00PM – 6:00PM



LOCATION: NO. 8 – COLLEGE ROAD AT OLD COLLEGE ROAD

DATE: SATURDAY, NOVEMBER 17, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

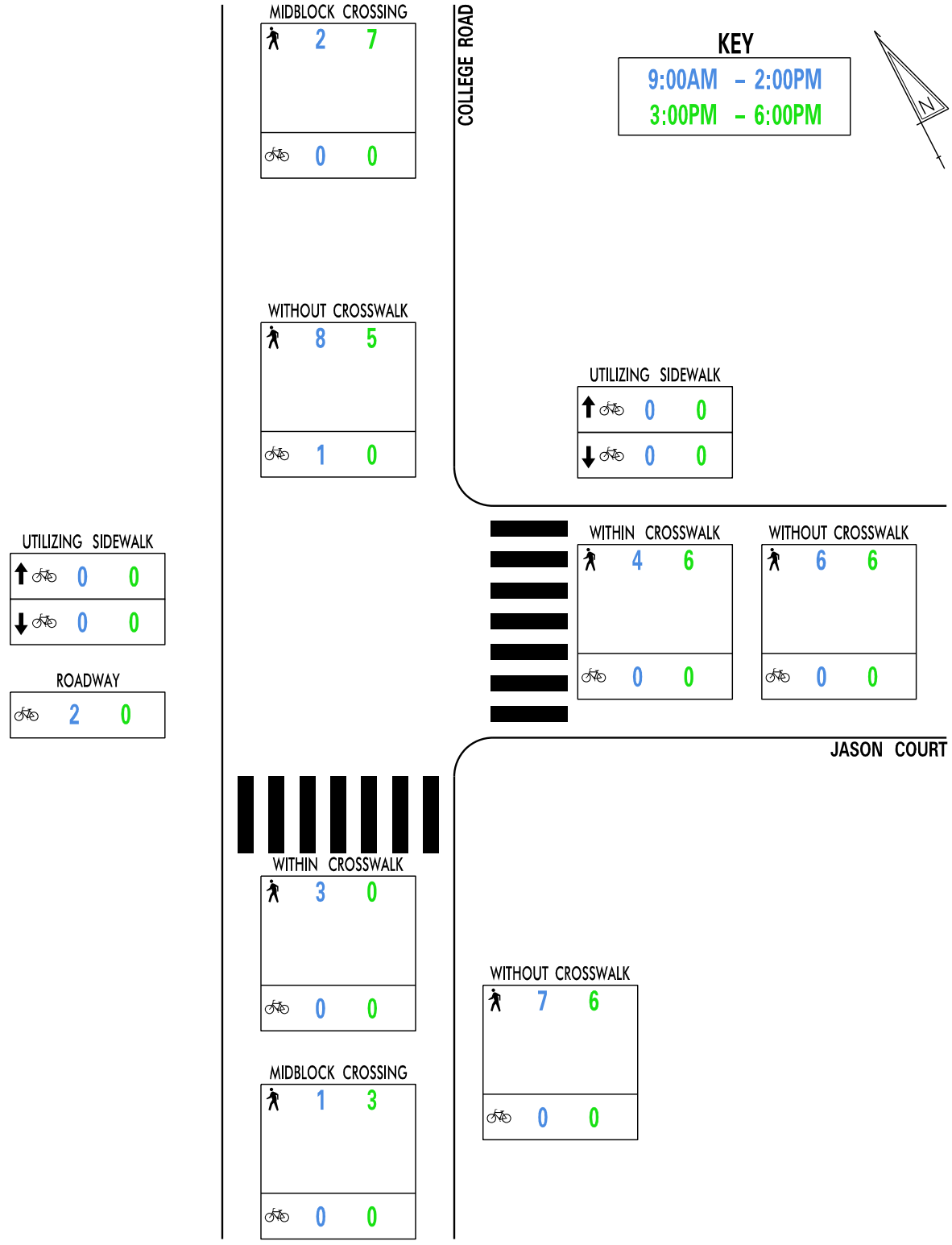
WEATHER: SUNNY

PREPARED BY: ANTHONY N.

DELAWARE STATE UNIVERSITY PED STUDY

CENTURY ENGINEERING

DelDOT



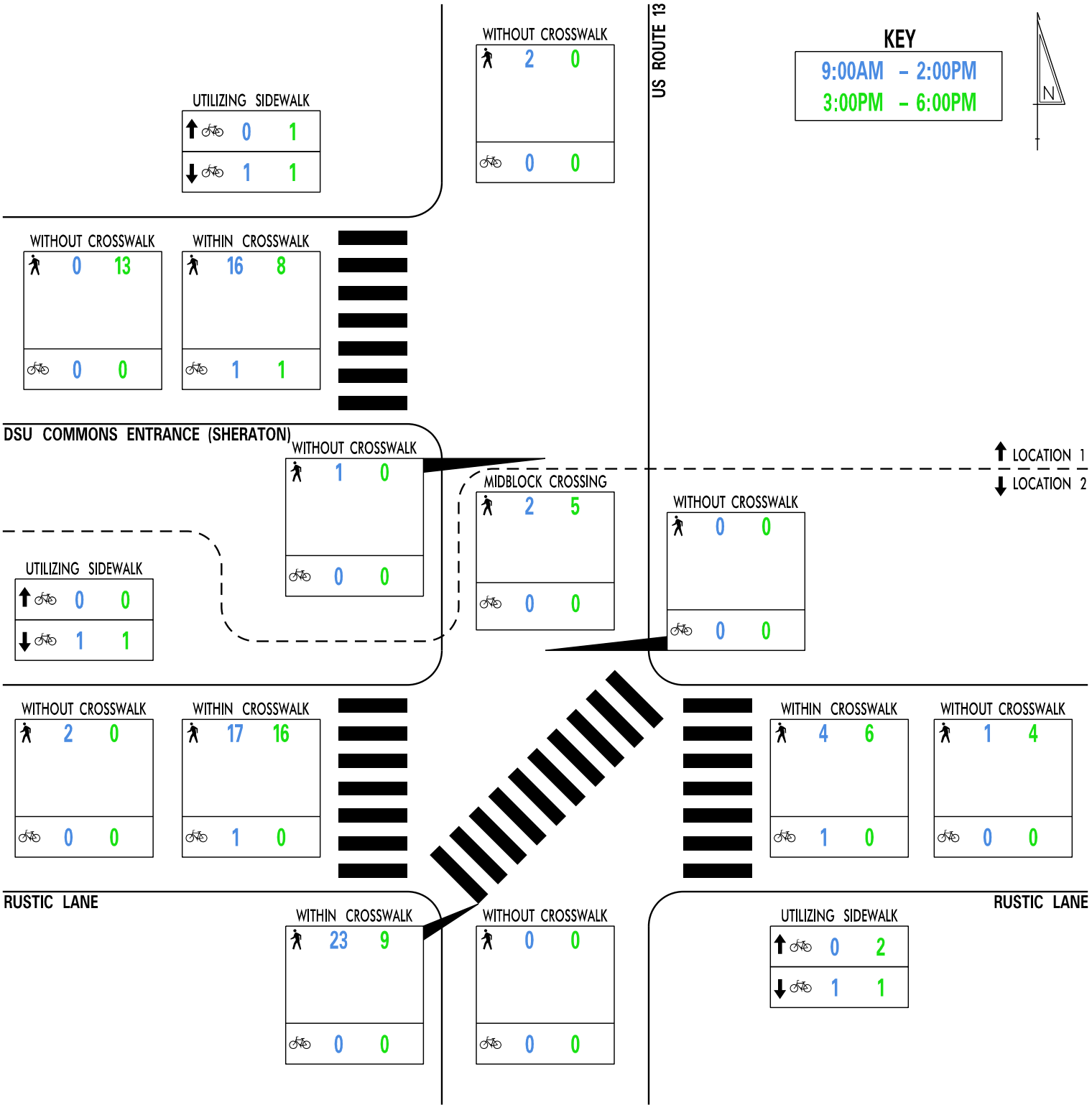
LOCATION: NO. 9 – COLLEGE ROAD FROM JASON COURT TO THE BRIDGE

DATE: SATURDAY, NOVEMBER 17, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

WEATHER: SUNNY

PREPARED BY: JIM H.



LOCATION: NO. 1 & 2 – DSU COMMONS ENTRANCE (SHERATON)/RUSTIC LANE

DATE: THURSDAY, NOVEMBER 27, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

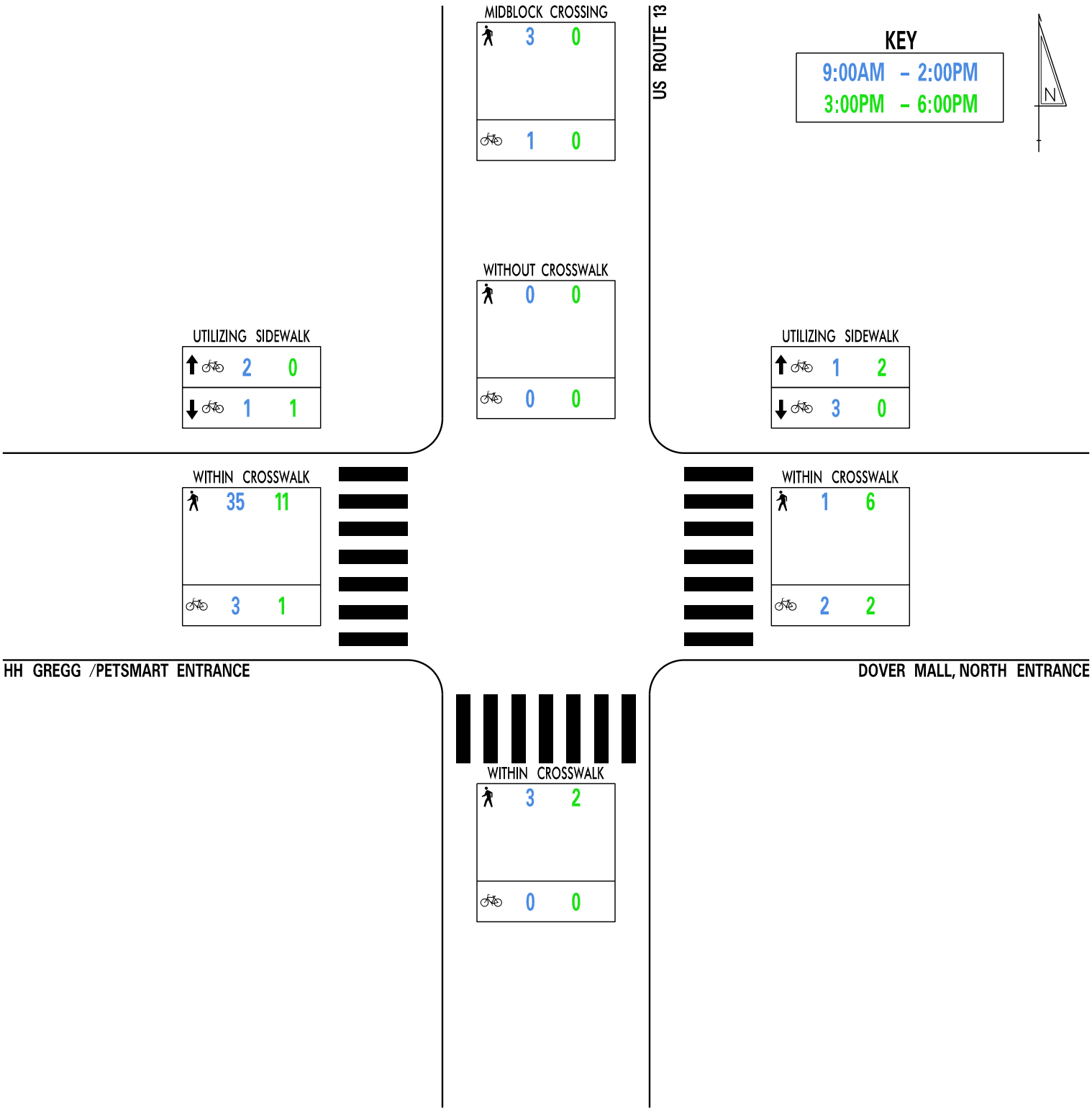
WEATHER: SUNNY

PREPARED BY: BRANDAN M. & LARRY C./PAT E.

CENTURY ENGINEERING

DELAWARE STATE UNIVERSITY PED STUDY

DelDOT



LOCATION: NO. 3 – DOVER MALL, NORTH ENTRANCE

DATE: THURSDAY, NOVEMBER 27, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

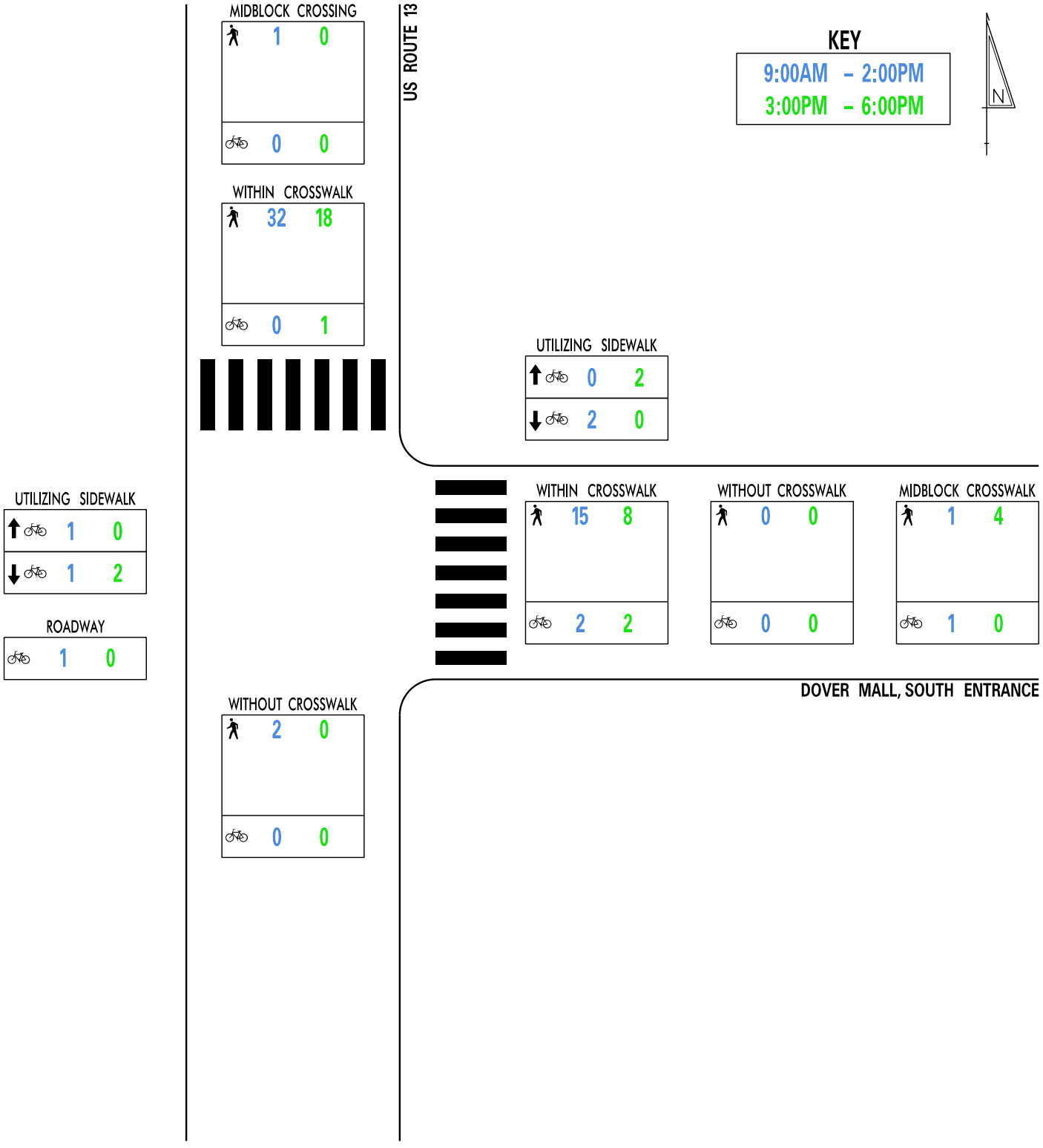
WEATHER: SUNNY

PREPARED BY: MIKE K. & RICKY L.

DELAWARE STATE UNIVERSITY PED STUDY

CENTURY ENGINEERING

DelDOT



LOCATION: NO. 4 – DOVER MALL, SOUTH ENTRANCE

DATE: THURSDAY, NOVEMBER 27, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

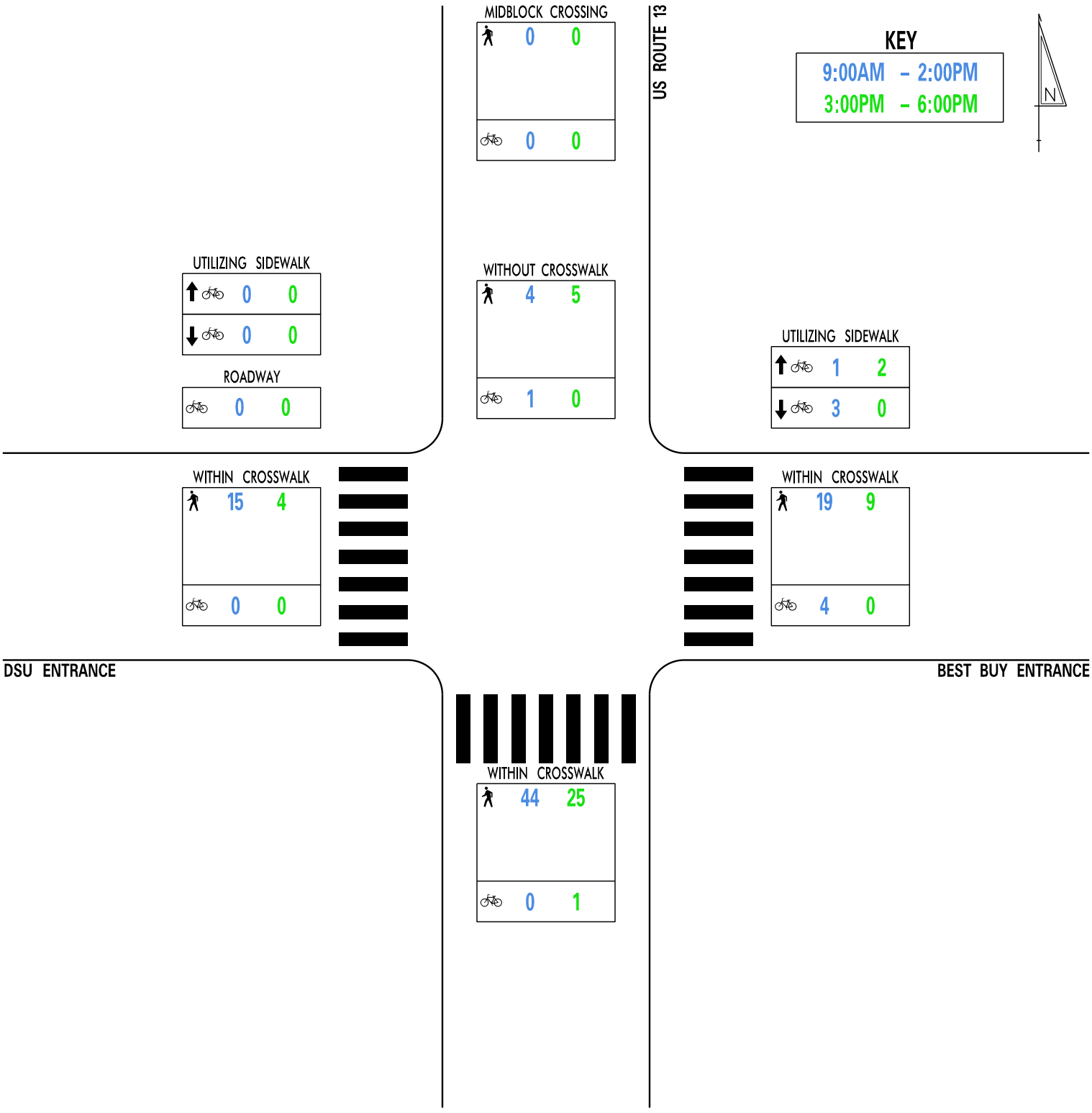
WEATHER: SUNNY

PREPARED BY: KYLE C. & PEDRO R.

DELAWARE STATE UNIVERSITY PED STUDY

CENTURY ENGINEERING

DelDOT



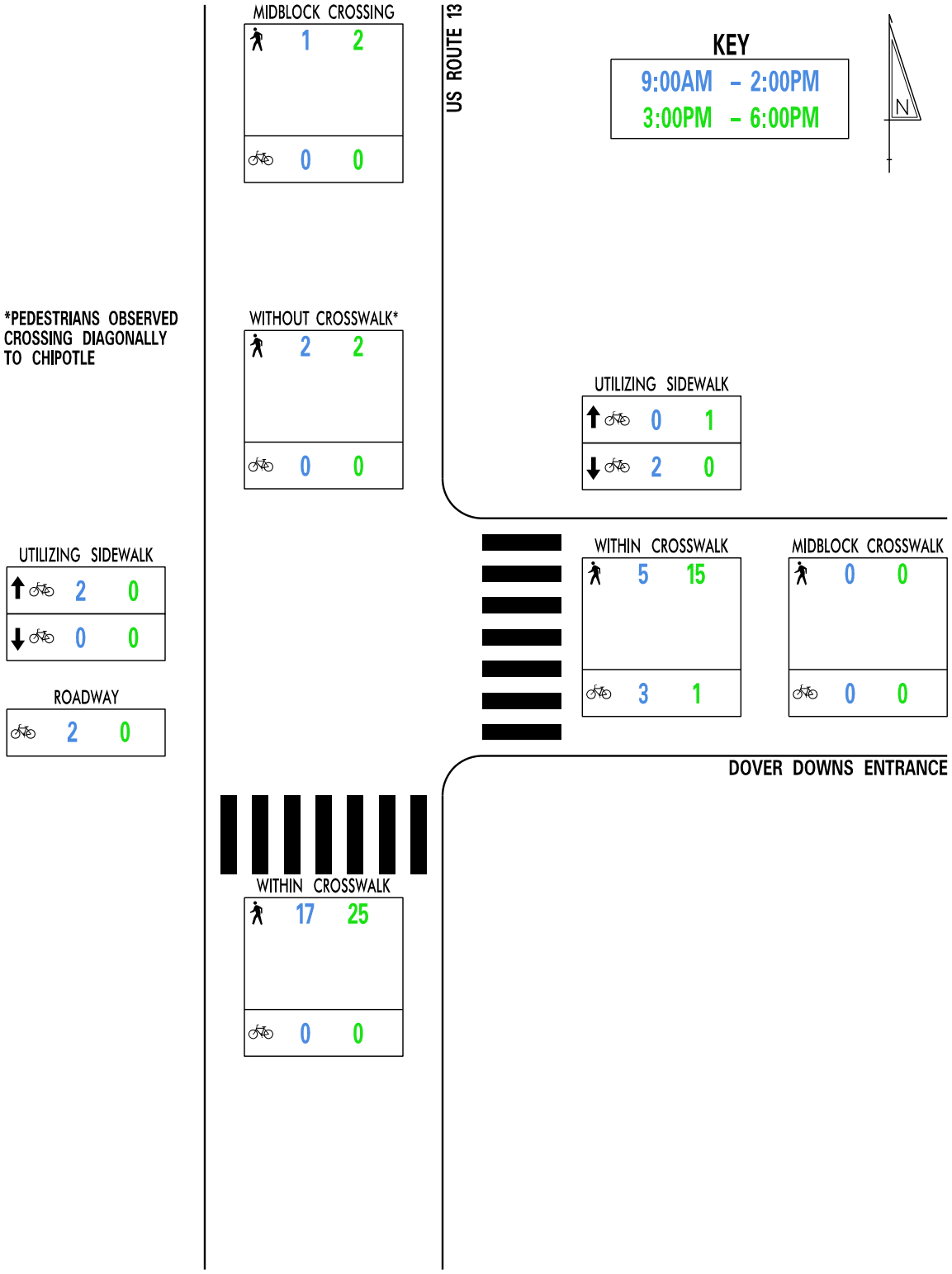
LOCATION: NO. 5 – DELAWARE STATE UNIVERSITY'S ENTRANCE

DATE: THURSDAY, NOVEMBER 27, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

WEATHER: SUNNY

PREPARED BY: SYRENA S. & BARRY S.



LOCATION: NO. 6 – DOVER DOWNS ENTRANCE

DATE: THURSDAY, NOVEMBER 27, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

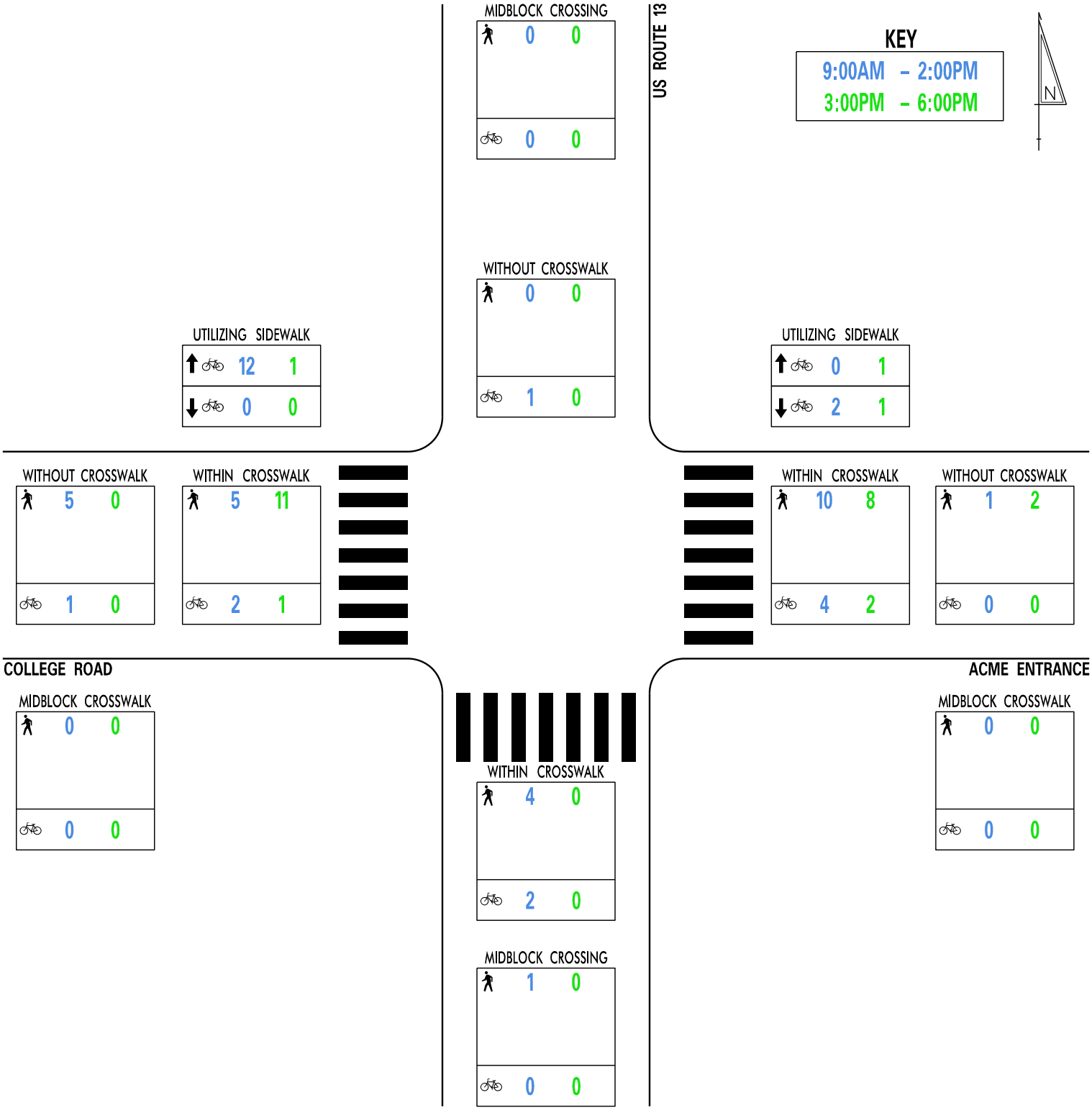
WEATHER: SUNNY

PREPARED BY: ELIZABETH C.

DELAWARE STATE UNIVERSITY PED STUDY

CENTURY ENGINEERING

DelDOT



LOCATION: NO. 7 – COLLEGE ROAD /ACME ENTRANCE

DATE: THURSDAY, NOVEMBER 27, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

WEATHER: SUNNY

PREPARED BY: DALLAS W. & EMILY P.

DELAWARE STATE UNIVERSITY PED STUDY

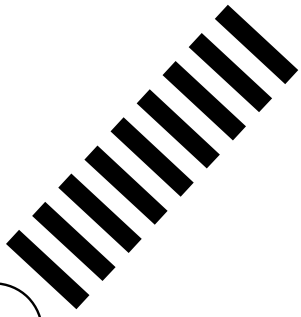
CENTURY ENGINEERING

DelDOT

KEY

9:00AM – 2:00PM

3:00PM – 6:00PM



WITHIN CROSSWALK: 33 15 / 0 1

WITHOUT CROSSWALK: 28 32 / 0 0

ON STREET DUE TO CONSTRUCTION: 290 183 / 0 0

OLD COLLEGE ROAD

WITHIN CROSSWALK: 102 43 / 2 0

SHOULDER: 0 0 / 0 0

WITHIN SIDEWALK: 140 60 / 2 1

WITHOUT CROSSWALK: 3 1 / 0 0

MIDBLOCK CROSSING: 2 0 / 0 0

WITHOUT CROSSWALK: 1 0 / 0 0

WITHOUT CROSSWALK: 0 0 / 0 0

MIDBLOCK CROSSING: 0 0 / 0 0

COLLEGE ROAD

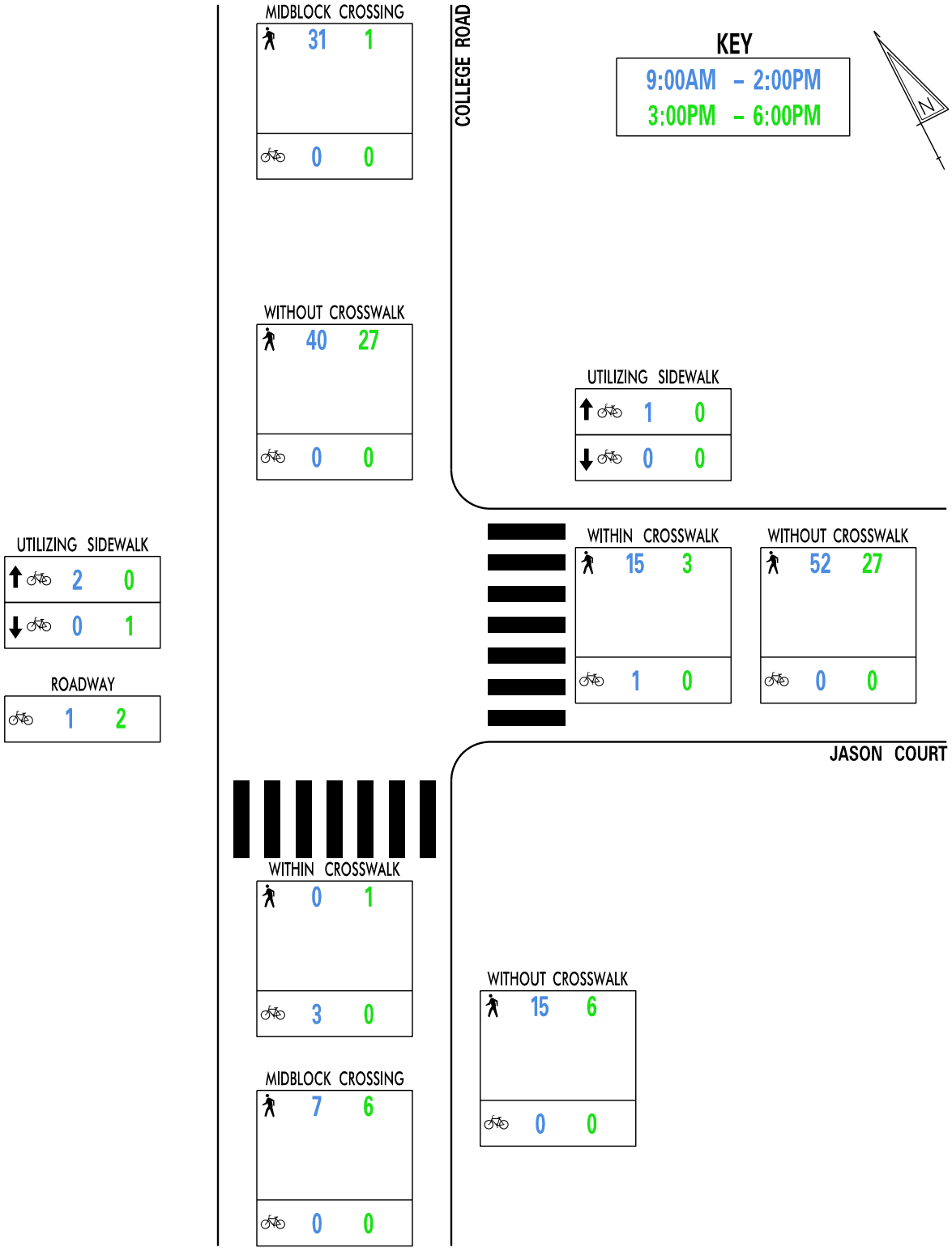
LOCATION: NO. 8 – COLLEGE ROAD AT OLD COLLEGE ROAD

DATE: THURSDAY, NOVEMBER 27, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

WEATHER: SUNNY

PREPARED BY: MIKE P.



LOCATION: NO. 9 – COLLEGE ROAD FROM JASON COURT TO THE BRIDGE

DATE: THURSDAY, NOVEMBER 27, 2018

TIME: 9:00AM – 2:00PM; 3:00PM – 6:00PM

WEATHER: SUNNY

PREPARED BY: JIM H.